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# Learning Analytics: European Perspectives

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## ABSTRACT

Since the emergence of learning analytics in North America, researchers and practitioners have worked to develop an international community. The organization of events such as SoLAR Flares and LASI Locals, as well as the move of LAK in 2013 from North America to Europe, has supported this aim. There are now thriving learning analytics groups in North American, Europe and Australia, with smaller pockets of activity emerging on other continents. Nevertheless, much of the work carried out outside these forums, or published in languages other than English, is still inaccessible to most people in the community. This panel, organized by Europe's Learning Analytics Community Exchange (LACE) project, brings together researchers from five European countries to examine the field from European perspectives. In doing so, it will identify the benefits and challenges associated with sharing and developing practice across national boundaries.

## Categories and Subject Descriptors

K.3.0 [Computers and Education]: General

## General Terms

Education, Ethics, Learning

## Keywords

Europe; international; LACE project; learning; learning analytics.

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## 1. INTRODUCTION

Since its formation in 2011, the Society for Learning Analytics Research (SoLAR) has, as its website states, worked to 'advance the field of learning analytics globally'. In order to achieve this objective, it has supported SoLAR Flare events that have brought practitioners together on three continents. It has also supported a network of LASI Local events that have been run in parallel with the main Learning Analytics Summer Institutes in the USA. In 2013, venues for LASI Local events included Hong Kong, South Africa and an online LASI-Latin-America event, as well as six events in different parts of Europe.

The Learning Analytics and Knowledge (LAK) conferences have also aimed to attract international engagement, and the organisers have actively monitored how successfully this has been achieved. At the 2013 conference, held in Leuven, Belgium, 'submissions were received with author affiliations from 31 countries worldwide, and accepted papers include affiliations from Australia, Belgium, Canada, the Czech Republic, Denmark, Ecuador, France, Germany, Greece, Hong Kong, Italy, Malta, the Netherlands, Norway, Spain, South Africa, Switzerland, the United Kingdom, and the United States of America' [5].

However, this positive representation of international engagement may obscure the fact that the majority of learning analytics research and practice visible to an international audience is written in English. Reports and tools that are designed for the benefit of regional and national audiences are rarely shared more widely unless they are originally written for English speakers. A review of the learning analytics literature carried out in 2012, focused on papers cited at the LAK conference and noted that, 'These papers were all written in English, and their authors had access to sufficient money to attend conferences. This study therefore underrepresents the learning analytics work carried out by non-English speakers and those from poorer countries' [3].

This focus on work produced in English-speaking countries is a problem because, as Suthers and Verbert noted when writing about learning analytics and the LAK13 conference, 'Learning

analytics is multidisciplinary, drawing on theories and methods from diverse research traditions. Our community includes educators, learning scientists, computer scientists, administrators, and policy makers [...] Many voices are brought together, leading to the question of how such multivocality can be productive' [5]. The range of voices within the community includes not only those from different research backgrounds and from different areas of practice, but also from different regions, nations and continents. If we can explore a range of ways of sharing work across national boundaries, we can benefit the entire international community.

## 2. LEARNING ANALYTICS COMMUNITY EXCHANGE (LACE)

In 2013, a consortium that includes organisations from Belgium, Italy, the Netherlands, Norway, Sweden and the UK initiated the Learning Analytics Community Exchange (LACE). This is a 30-month community support action that is funded by the European Commission's Framework Seven. The LACE project brings together key European players in the field of learning analytics and educational data mining (EDM), all of whom are committed to building communities of practice and sharing emerging best practice in order to maximize the practical benefits of learning analytics across Europe. Some of these key players are members of the project consortium; others are involved as associate partners, thus expanding the reach of the network across Europe.

In the original description of the LACE project, which was submitted to the European Commission in 2012, consortium members identified three reasons for establishing an organization that could work with schools, higher education establishments and businesses across Europe in the field of learning analytics.

1. Knowledge of what makes for effective and desirable learning analytics is not well developed, so research and practice need to be shared across national boundaries in order to be able to develop this knowledge effectively.
2. The history of the development of technology-enhanced learning (TEL) in Europe, and globally, shows that the market cannot sustain many nationally specific or niche products. Despite regional and national variations, Europeans will benefit if they can use common products or adopt common standards that allow smaller scale or niche products to be viable and product innovation to flourish.
3. Operational systems and research in the fields of learning analytics and EDM, as well as learning science research, improve as the quantity of data increases. Although combining data sets is challenging, it makes sense to reduce the challenges to data sharing by taking whatever common approaches are practicable.

Although the focus of LACE activity is on Europe, its work is also intended to influence and benefit the global learning analytics community. This panel will help to achieve this objective by:

- Providing examples of how researchers and practitioners from different backgrounds and with different perspectives can work together effectively to develop research and practice around learning analytics.
- Increasing international access to learning analytics work that has been developed at local or national scale and that has not previously been reported in English
- Demonstrating ways in which research expertise developed within European networks and communities both currently and over the past decade can be used to strengthen learning analytics work on a global scale.

- Discussing ways in which different sets of standards and legal frameworks can be taken into account and brought together effectively.
- Sharing details of the LACE Evidence Hub, which builds on similar work carried out in the field of open educational resources and elsewhere [1; 2]
- Initiating conversations and research plans that can be developed in future to the benefit of both the European and the global learning analytics community.

## 3. AREAS FOR PANEL DISCUSSION

The panel will present a range of European perspectives, based on work carried out on both European and national projects.

### 3.1 The work of the LACE project

Rebecca Ferguson and other LACE consortium partners will briefly outline work being carried out by the project that will be of interest to those attending LAK15. This will include a short introduction to the LACE Evidence Hub, a site that brings together evidence about learning analytics and clarifies how it relates to a series of key questions that have emerged in the field. Contributions to the Evidence Hub from LAK15 participants will be welcomed and will help to strengthen this international resource.

### 3.2 Privacy issues and data standards

Hendrik Drachslar and Adam Cooper will then focus on two related areas of the LACE project's work. Developing learning analytics across national boundaries is a complex undertaking. This is, in part, because different standards and legal frameworks apply in each case.

In the case of data standards, the LACE project is currently working on the development of common terminology to advance interoperability, with a focus on data elements that are found in current practice. The intention is to indicate and explain, from the particular perspective of learning analytics, where common models or standards could advance adoption, research, and innovation. A key part of this investigation is to gather evidence from attempts to use current data standards. The project is also considering data-sharing platforms and will make recommendations in respect of high level system architecture, sustainability, and a range of cultural, legal and ethical issues. Adam Cooper will outline progress to date, and will explore ways in which this work can benefit the international community and the relationship of this work to the open learning analytics initiative [4].

Hendrick Drachslar will deal with issues of privacy and ethics. He will consider ways in which the production, collection and processing of information from various learning platforms and online environments have led to ethical and privacy concerns within Europe with regard to potential harm to individuals and to society. Concerns of this type have already had impact on areas as diverse as computer science, legal studies and surveillance studies. Hendrick will outline work carried out jointly by SURF (a collaborative organisation for ICT in Dutch higher education and research) and the LACE project in order to improve understanding of the issues and research challenges related to the ethical and privacy aspects of learning analytics. Part of this programme of work has involved gathering examples of issues from across Europe to develop solutions that can be applied internationally.

### 3.3 Working together across national boundaries

The LACE project is just one of the many trans-European projects to be funded by the European Commission. Alejandra Martínez Monés will talk about some of the work that was carried out as part of the European Kaleidoscope Network of Excellence and that has implications for the development of learning analytics internationally.

The Kaleidoscope network brought together TEL researchers from diverse disciplines and cultures across Europe to work collaboratively on interdisciplinary projects that drew upon their unique perspectives and areas of expertise. Through this collaboration and sharing of scientific outcomes, they helped to move the field of technology-enhanced learning forward.

One series of projects that was linked to Kaleidoscope employed data collected from learning and teaching interactions in order to produce meaningful results usable by teachers and students. These related projects aimed to conceptualise interaction analysis processes and tools in ways that took into account evaluation, monitoring and self-reflection. As collaborative learning is a complex process, which is difficult to control and predict, a primary focus of these projects was on supporting participants in performing their tasks better, with the aim of enhancing their overall collaborative learning experience.

This European work now forms a basis for international work on collaborative learning and analytics.

### 3.4 Developing a centre for learning analytics research

While some projects related to TEL and learning analytics are funded at a European level, other initiatives emerge at a national level. Gábor Kismihók will describe the development of the Learning Analytics Task Force at the University of Amsterdam. This initiative began in 2012 when a number of educators, researchers, and members of the innovation workgroup of the ICT services of the University of Amsterdam decided to join forces.

The Task Force works at university level, but also has strong ties to the Learning Analytics Special Interest Group within The Netherlands, and facilitates collaboration on learning analytics between universities. This supports economies of scale when it comes to carrying out research and developing tools. The Task Force also serves as a platform for communication, so that different faculties do not find that they are replicating work that need only be carried out once and then shared.

The Task Force also has an international aspect, aiming to become a leading European centre of learning-analytics-driven research, teaching, and social responsibility and innovation.

### 3.5 Learning analytics initiatives from Estonia and France

Across Europe, learning analytics projects are underway that offer the potential for impact beyond national boundaries.

The Estonian learning analytics community only emerged recently, and the number of researchers within it is still relatively small. Kairit Tammets will talk about initiatives developed by this community that deserve attention on a wider scale.

The community-based system *eDidaktikum* has been designed to support Estonian teacher education and is used by five teacher education institutions. The tool uses learning analytics to provide

instant feedback to learners and course designers and to conduct retrospective analysis of users' engagement with the system.

*Dippler* is a digital learning ecosystem intended for use in higher education. It combines the strengths of institutional Learning Management Systems with those of blog-based Personal Learning Environments. *Dippler* connects assignments with learning outcomes through the use of domain taxonomy based keywords, enabling contextualised analysis of learning interactions.

*Educational Cloud* is funded by the Estonian Ministry of Education and Science, and makes use of learning analytics at the level of secondary education. The aim is to develop a digital ecosystem and toolsets for managing and accessing digital resources that are produced and hosted by various content providers. The system aggregates and makes accessible meta-data related to digital learning resources such as e-textbooks that are located in different repositories. Publishers, teachers and students can create collections of these resources and share their collections with other users. The system will track interactions with these collections and related resources and aggregated interaction data will be collected in a learning record store.

The xAPI specification is used on all these Estonian projects, and so an informed and critical view of xAPI is also a focus of the Estonian learning analytics community.

Kairit's summary of learning analytics work in Estonia will be followed by Anne Boyer, who will draw a panorama of research activities in the field of learning analytics in France.

Presentations by panel participants will be followed by opportunities for questions and open discussion. The intention is that these will provide starting points for discussions and research collaborations that will continue throughout LAK15 and will be developed in the future.

## 4. ACKNOWLEDGMENT

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## **ENSURING INTERACTION BETWEEN PANEL PARTICIPANTS**

Panel participants are based in a variety of countries across Europe and are all either members of the LACE consortium, or associated partners of the LACE project. This shared connection brought them together before the project panel was proposed, and it is this connection that will form a common thread that links the different presentations within the panel.

### **PANEL PARTICIPANTS**

#### **Rebecca Ferguson**

Rebecca is a lecturer based in the Institute of Educational Technology at The Open University, and a work package leader in the LACE project. She was Workshops Chair of the Learning Analytics and Knowledge conference in 2012 (LAK 2012) and co-chair of the 1st and 2<sup>nd</sup> International Workshops on Discourse-Centred Analytics. She has co-chaired two UK SoLAR Flares – national symposia on learning analytics – organised under the auspices of the international Society for Learning Analytics Research (SoLAR). Rebecca has published extensively on learning analytics and social learning analytics.

#### **Adam Cooper**

Adam is a leading member of the LACE project consortium. He is co-director of CETIS, an organisation that works on educational technology innovation across the UK post-compulsory education sector. He has more than 13 years experience working in interoperability and standards organisations, nationally and internationally, and is currently a member of the UK Government Open Standards Board and education ministry's Information Standards Board. He has prior experience in the commercial sector and managed a college learning technology department in the late 1990s

#### **Hendrik Drachsler**

Hendrik is Assistant Professor at the CELSTEC Mobile Media Programme in the Centre for Learning Sciences and Technologies at the Open Universiteit Nederland. He is a work package leader on the LACE project as well as on other European research projects, both past and present. His research interests include learning analytics, personalization technologies, recommender systems, educational data, open science, mobile devices, and their applications in the fields of technology enhanced learning, science 2.0, and health 2.0. He is the leader of the EATEL SIG, dataTEL, and is a core member of the Learning Analytics special interest group of the Dutch umbrella organization SURF.

#### **Gábor Kismihók**

Gábor obtained a summa cum laude PhD in management sciences from the Corvinus University of Budapest in 2012. As co-founder of the Center of Job Knowledge Research, he supervises four PhD students in the fields of HRM – data science and learning analytics. He has managed a number of large-scale innovation networks with a budget of 3,7M EUR and smaller scale innovation projects with a budget of 500K EUR. He has also written a series of successful research project proposals (FP7, FP7 MC ITN, EU LLP, TAMOP). He has published his research in various peer-reviewed international journals and book chapters in the fields of knowledge management and education (including the British Educational Research Journal, the European Journal of Education, the International Journal of Knowledge and Learning, and the International Journal of Mobile and Blended Learning). He is a core member of the Learning Analytics special interest group of the Dutch umbrella organization SURF.

#### **Alejandra Martínez Monés**

Alejandra is an associate professor at the University of Valladolid with a long-standing research interest in collaborative learning and social network analysis. This has led her to research networks of engagement within Kaleidoscope, a 'European Network of Excellence' in which over 1,000 researchers and practitioners from more than 90 institutes across Europe have participated. Alejandra was a participant in the LASI Local that took place in Madrid in 2014, organized by the Spanish Network of Learning Analytics (SNOLA), a Spanish special interest group.

#### **Kairit Tammets**

Kairit is a researcher at Estonia's Institute of Informatics – Centre for Educational Technology (CET) – at Tallinn University. She is currently involved in two large-scale European projects that make use of learning analytics: the European Multiple MOOC Aggregator (EMMA) and Learning Layers, which is developing a set of modular and flexible technological layers that scaffold learning in networks of small and medium-sized enterprises.

#### **Anne Boyer**

Anne is a professor at the University of Lorraine, where she is a team leader in the area of knowledge, information and web intelligence. This includes research into social networks and recommender systems. She is also an adviser on open educational resources for France's ministère de l'Éducation nationale de l'enseignement supérieur et de la recherche (MENESR).